

9

9.1

FreeBSD

FreeBSD ; FreeBSD

FreeBSD MacOS 가
. FreeBSD

" "

:

- FreeBSD 가
- 가 가
- 가
- 가
- 가
- 가
- 가
- 가
- 가

:

- 가(8)

9.2

FreeBSD

LPD

FreeBSD

LPD

LPD

LPD

가

LPD

:

-
- 가 ;
- 가
- (*burst*)
-
- LPD
-
-

(/etc/printcap)

가

LPD

9.2.1

가

가

- LPD ; 가 가
가 .

- LPD / 가 가
(TeX DVI) .

- 가

9.3

LPD

LPD

가

:

- LPD 가

- , , , ,

9.3.1

가 : LPD

- 가
- LPD (/etc/printcap)

(9.4.3.2)

" " LPD
가

9.3.1.1

PC
FreeBSD 가

가

[]

1.	가	가	PC
:			
•			가



-

PC 가

가

"Centronics"



- Universal Serial Bus

USB

RS232

. USB

RS232

USB

가



()
(EPP ECP) FreeBSD USB IEEE1284

가 FreeBSD

가

가 가
가 가

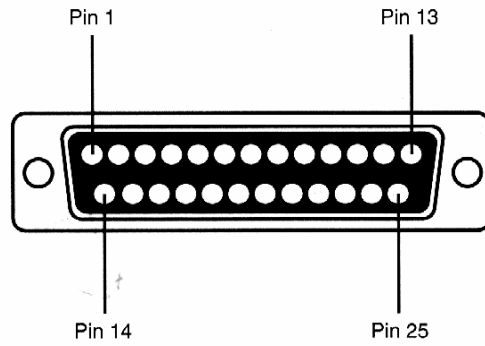
()

2.

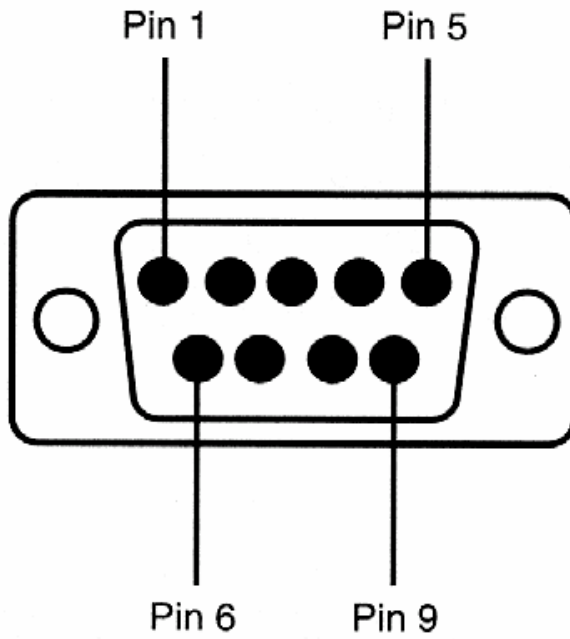
Centronics

FreeBSD

/dev/ppc0 /dev/ppc1
: /dev/lpt0



3.



"DTE - DCE"


```

•
) (hood)
(Short) "DTE - DTE"
•
DIP
가 bps ( bit
(baud) ) . 7 8 ; none, even, odd parity; 1
2 stop ; none XON/XOFF( "in-band"
" " )

```

9.3.1.2

FreeBSD LPD

```

가 ;
;
가
/etc/printcap LPD

```

[]

```
가

:

# grep sioN /var/run/dmesg.boot

N 0 가

sio2 at port 0x3e8-0x3ef irq 5 on isa
sio2: type 16550A

:

# grep ppcN /var/run/dmesg.boot

N 0

ppc0: <Parallel port> at port 0x378-0x37f irq 7 on isa0
ppc0: SMC-like chipset (ECP/EPP/PS2/NIBBLE) in COMPATIBLE mode
ppc0: FIFO with 16/16/8 bytes threshold

가

가 가
```

9.3.1.3 /dev 가

Note: FreeBSD 5.0 *devfs*
가 . *devfs* 가 FreeBSD

가 . /dev

[: /dev 가,]

```

1. /dev 가

su(1) root 가 . 가 root .

/dev :

# cd /dev

:

# ./MAKEDEV port

port . lpt0

lpt1 ; 가

ttyd0 ttyd1 .

:

# ls -l port

가
    
```

2.

```

FreeBSD 가 interrupt-driven      polled
      . FreeBSD 4.X      5.X
      ppc(4)                ppbus(4)
      .

• interrupt-driven      GENERIC      .
      가                가                IRQ      .

• polled                가                가
      .                가

interrupt-driven      IRQ      .
      HP                가(
      )                가

      lptcontrol(8)                가

      :

      ppc0                .
      ppc1                ppc2      .

• interrupt-driven      FreeBSD 4.X      irq      :

      device ppc0 at isa? irq N

      N                IRQ      .

FreeBSD 5.X                :

      hint.ppc.0.irq="N"
    
```

```

/boot/device.hints          IRQ      N      .
    ppc(4)                  가      :

    device ppc

    ● polled                irq      가      :

FreeBSD 4.X                  :

    device ppc0 at isa?

FreeBSD 5.X                  /boot/device.hints
    :

    hint.ppc.0 irq="N"

    FreeBSD 5.X      polled
    .                acpi(4)

    acpi(4)          .

    ,                .

    .

lptcontrol(8)          :

    :

    # lptcontrol -i -d /dev/lptN

    lptN      interrupt-driven

    :
    
```

```

# lptcontrol -p -d /dev/lptN

lptN polled -
가 /etc/rc.local
lptcontrol(8)

3.
가
가
lptest(1) : ASCII 96 96
( ) 가
:

%IPS
100 100 moveto 300 300 lineto stroke
310 310 moveto /Helvetica findfont 12 scalefont setfont
(Is this thing working?) show
showpage

Note: PCL
. PCL 가 escape

4.

```

```
FreeBSD 가
.
:

su(1) root 가
.

● 가 lptest(1)
:

# lptest > /dev/lptN

N 0
.

● 가
:

# cat > /dev/lptN

RETURN ENTER

CONTROL+D
.

# cat file > /dev/lptN

file 가
.

가 가 ;

5.
```

FreeBSD 가

su(1) root 가

/etc/remote 가 :

printer:dv=/dev/port:br# bps -rate:pa=parity

port (*ttyd0, ttyd1*) , *bps -rate*
parity (*even, odd, none*
zero)

19200bps
가 :

printer:dv=/dev/ttyd2:br#19200:pa=none

tip(1) :

tip printer

가 /etc/remote /dev/ttydN
/dev/cuaaN

- 가 lptest(1)
:

% \$lptest

- 가


```

CONTROL + D
:
% >file
file 가 tip(1)
가 ;

```

9.3.1.4 : /etc/printcap

가 ()
LPD 가
/etc/printcap LPD LPD 가
printcap(5) /etc/printcap
/usr/share/misc/termcap /etc/remote
cgetent(3)
:
() /etc/printcap
;
sh () ;
sd ;


```

                                /etc/printcap
                                (l)
(;)
                                가(Diablo 630           Panasonic KX-P4455
                                ) /etc/printcap           :

#
# /etc/printcap for host rose
#
rattan|line|diablo|lp|Diablo 630 Line Printer:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:

                                rattan   line, diablo, lp   Diablo 630 Line Printer
가           .           lp           가           가           .
                                bamboo   ps, PS, S, panasonic   Panasonic KX-P4455 PostScript
v51.4           가           .

2.
LPD

가

                                sh           /etc/printcap           가           sh가
가 /etc/printcap           가           :

#
# /etc/printcap for host rose - no header pages anywhere
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
:sh:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:

```

```
:sh:

가          :
          TAB      .
          .
3.
          .
          /var/spool
          mkdir(1)
:
# mkdir /var/spool/printer-name
          가          LPD
          rattan bamboo
:
# mkdir /var/spool/lpd
# mkdir /var/spool/lpd/rattan
# mkdir /var/spool/lpd/bamboo

Note:   가

          .
          ,
          :

# chown daemon:daemon /var/spool/lpd/rattan
# chown daemon:daemon /var/spool/lpd/bamboo
# chmod 770 /var/spool/lpd/rattan
# chmod 770 /var/spool/lpd/bamboo
```

```

/etc/printcap                                LPD                                . sd
:

#
# /etc/printcap for host rose - added spooling directories
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
    :sh:sd=/var/spool/lpd/rattan:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
    :sh:sd=/var/spool/lpd/bamboo:

sd                                           /var/spool/lpd

4.
    /dev          가      FreeBSD 가          /dev
    .             LPD
    가            (      가 )

/etc/printcap    /dev          lp
    rattan      bamboo
    가 ;        /etc/printcap 가 :

#
# /etc/printcap for host rose - identified what devices to use
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
    :sh:sd=/var/spool/lpd/rattan:

```

```
:lp=/dev/lpt0:
```

```
bamboo|ps|PS|S|panasonic|Panasonic KX - P4455 PostScript v51.4:
```

```
:sh:sd=/var/spool/lpd/bamboo:
```

```
:lp=/dev/ttyd5:
```

```
/etc/printcap      lp          LPD      /dev/lp
```

```
    . /dev/lp      FreeBSD
```

```
가
```

5.

LPD

```
bps ,
```

```
:
```

- /etc/printcap ;

- 가 가

```
/etc/printcap lp :
```

br#bps - rate

50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800,

2400, 4800, 9600, 19200, 38400, 57600 115200 *bps -*

rate

ms#stty - mode

```
. stty(1)
```

```

LPD 가 lp                               ms#
.
.          stty(1)                       parenb, parodd, cs5, cs6,
cs7, cs8, cstopb, crtscts ixon

```

```

.          가      bps      38400
-parenb      , cs8  8-bit      , clocal      crtscts
:
```

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:

```
:sh:sd=/var/spool/lpd/bamboo:
```

```
:lp=/dev/ttyd5:ms# -parenb cs8 clocal crtscts:
```

6.

```

LPD
(input)                                LPD 가
.
.          LPD 가
lp

```

```

.          /bin/cat
. FreeBSD          ( )
lpf          가
lpf

```

```

가 /usr/local/libexec/if-simple
:
```

```
#!/bin/sh
```

```
#
```

```
# if-simple - Simple text input filter for lpd
```

```
# Installed in /usr/local/libexec/if-simple
```

```
#
```

```
# Simply copies stdin to stdout.  Ignores all filter arguments.
```

```
/bin/cat && exit 0
```

```
exit 2
```

```
:
```

```
# chmod 555 /usr/local/libexec/if - simple
```

```
        /etc/printcap   if                LPD 가
가 가                가   /etc/printcap   :
```

```
#
```

```
# /etc/printcap for host rose - added text filter
```

```
#
```

```
rattan|line|diablo|lp|Diablo 630 Line Printer:
```

```
        :sh:sd=/var/spool/lpd/rattan:   :lp=/dev/lpt0:
```

```
        :if=/usr/local/libexec/if - simple:
```

```
bamboo|ps|PS|S|panasonic|Panasonic KX - P4455 PostScript v51.4:
```

```
        :sh:sd=/var/spool/lpd/bamboo:
```

```
        :lp=/dev/ttyd5:ms# - parenb cs8 clocal crtscts:
```

```
        :if=/usr/local/libexec/if - simple:
```

7. LPD

```
lpd(8)  /etc/rc                lpd_enable                .                NO .
        /etc/rc.conf          가                :
```

```
        lpd_enable="YES"
```

```
        lpd(8)                .
```

```
# lpd
```


8.

```

LPD
가
                                . LPD
                                lpr(1)
                                .
                                lpr(1)  lptest(1)

LPD
:

# lptest 20 5 | lpr -Pprinter - name

printer - name /etc/printcap
-P lpr(1)
lptest(1) lpr file

                                . lptest(1)
                                :

!"#$%&'()*+,-./01234
"#$$$%&'()*+,-./012345
#$$$%&'()*+,-./0123456
$$$%&'()*+,-./01234567
$$$%&'()*+,-./012345678

                                (
                                )

lptest(1) lptest 80 60 60 80

가

```

9.4

9.4.1

LPD 가

)

quirks

가

FreeBSD
/usr/libexec/lpr/lpd (

.) 가 . FreeBSD 가

가

- 가 가
LPD 가

- LPD 가

) 가

가

가

가

- typesetting 가

가 troff lpr -t TeX DVI lpr -d
lpr -v

- LPD :

- lpf lpf (가 FreeBSD)
lpf 가 가 lpf

9.4.1.1 가 가

LPD 가

LPD

(/etc/printcap /dev/console if).

LPD 가 /etc/printcap

lpr(1) 가 lpr -t LPD
tf troff 가

LPD if (:)

/etc/printcap 3 가 :

● LPD

가 LPD 가

가

filter-name [-c] -wwidth -llength -iindent -n login -h host acct-file

-c

lpr -l

width

/etc/printcap 132 pw ()

length

66 pl ()

indent

0 lpr -i () ..

login

host

acct-file

af

- *dirtoff* 가 *ditroff* 가
ditroff 가 :

filter-name -xpixel-width -ypixel-height -n login -h host acct-file

pixel-width px (0) pixel-height py (0)

- (output) 가 가
:

filter-name -wwidth -llength

-w -l

exit :

exit 0

exit 1

가 LPD 가
LPD .

exit 2

가 LPD 가 . LPD .

FreeBSD /usr/libexec/lpr/lpf (feed)
width length .

LPD 가 exit

9.4.1.2

()

가 .

가 %! ()

가

가

```

가      ?

      가      가      lprps      . lprps

      가      ( 가      가
)      .      psif
(lprps      )      textps      가
      .      lprps      .

lprps FreeBSD      (      ).
      . lprps      lprps      psif
      . lprps      /etc/printcap

      :

:if=/usr/local/libexec/psif:

      LPD 가      -      rw      .

      (      lprps 가      )

가      :

```

```

#!/bin/sh
#
# psif - Print PostScript or plain text on a PostScript printer
# Script version; NOT the version that comes with lprps
# Installed in /usr/local/libexec/psif
#

IFS="" read -r first_line
first_two_chars=`expr "$first_line" : ' (.. )'`

if [ "$first_two_chars" = "%!" ]; then
#
# PostScript job, print it.
#
echo "$first_line" && cat && printf " 004" && exit 0

```

```

exit 2
else
#
# Plain text, convert it, then print it.
#
( echo "$first_line"; cat ) | /usr/local/bin/textps && printf " 004" && exit 0
exit 2
fi

```

textps 가
FreeBSD 가 a2ps

9.4.1.3

de facto
Aladdin Enterprises FreeBSD
Ghostscript 가
FreeBSD
가
가 : 500
-sDEVICE gs() (gs -h
가 .).

```
#!/bin/sh
```



```
#
# ifhp - Print Ghostscript-simulated PostScript on a DeskJet 500
# Installed in /usr/local/libexec/ifhp

#
# Treat LF as CR+LF:
#
printf " 033&k2G" || exit 2

#
# Read first two characters of the file
#
IFS="" read -r first_line
first_two_chars=`expr "$first_line" : ' (.. )'`

if [ "$first_two_chars" = "%!" ]; then
    #
    # It is PostScript; use Ghostscript to scan-convert and print it.
    #
    # Note that PostScript files are actually interpreted programs,
    # and those programs are allowed to write to stdout, which will
    # mess up the printed output. So, we redirect stdout to stderr
    # and then make descriptor 3 go to stdout, and have Ghostscript
    # write its output there. Exercise for the clever reader:
    # capture the stderr output from Ghostscript and mail it back to
    # the user originating the print job.
    #
    exec 3>&1 1>&2
    /usr/local/bin/gs -dSAFER -dNOPAUSE -q -sDEVICE=djet500
        -sOutputFile=/dev/fd/3 - && exit 0
else
    #
    # Plain text or HP/PCL, so just print it directly; print a form feed
    # at the end to eject the last page.
    #
    echo "$first_line" && cat && printf " 033&IOH" &&
```



```

가 .

/etc/printcap

bamboo DVI 가 .
bamboo df /etc/printcap

#
# /etc/printcap for host rose - added df filter for bamboo
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
    :sh:sd=/var/spool/lpd/rattan:
    :lp=/dev/lpt0:
    :if=/usr/local/libexec/if-simple:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
    :sh:sd=/var/spool/lpd/bamboo:
    :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:
    :if=/usr/local/libexec/psif:
    :df=/usr/local/libexec/psdf:

DVI /usr/local/libexec/psdf 가 :

#!/bin/sh
#
# psdf - DVI to PostScript printer filter
# Installed in /usr/local/libexec/psdf
#
# Invoked by lpd when user runs lpr -d
#
exec /usr/local/bin/dvips -f | /usr/local/libexec/lprps "$@"

dvips (-f ) . LPD
lprps (
) . lprps

```

4.

```

가
가
III - SI ( GIF )
:

#!/bin/sh
#
# hpvf - Convert GIF files into HP/PCL, then print
# Installed in /usr/local/libexec/hpvf

PATH=/usr/X11R6/bin:$PATH; export PATH
giftopnm | ppmtopgm | pgmtopbm | pbmtolj -resolution 300
    && exit 0
    || exit 2

GIF 가 anymap graymap, bitmap
/PCL

/etc/printcap 가 :

#
# /etc/printcap for host orchid
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
    :lp=/dev/lpt0:sh:sd=/var/spool/lpd/teak:mx#0:
    :if=/usr/local/libexec/hpif:
    :vf=/usr/local/libexec/hpvf:

bamboo groff typesetting troff
:

```

```

#!/bin/sh
#
# pstf - Convert groff's troff data into PS, then print.
# Installed in /usr/local/libexec/pstf
#
exec grops | /usr/local/libexec/lprps "$@"

                                lprps                                .                가

                                :

#!/bin/sh
#
# pstf - Convert groff's troff data into PS, then print.
# Installed in /usr/local/libexec/pstf
#
exec grops

                                /etc/printcap                가                가                :

:tf=/usr/local/libexec/pstf:

                                FORTRAN blush                가                가                .
                                FORTRAN-                        .                teak                                :

#!/bin/sh
#
# hprf - FORTRAN text filter for LaserJet 3si:
# Installed in /usr/local/libexec/hprf
#

printf " 033&k2G" && fpr && printf " 033&l0H" &&
exit 0
exit 2

                                teak                                /etc/printcap                가                :

```



```
# Define a function to clean up our temporary files.  These exist
# in the current directory, which will be the spooling directory
# for the printer.
#
cleanup() {
    rm -f hpdf$$dvi
}

#
# Define a function to handle fatal errors: print the given message
# and exit 2.  Exiting with 2 tells LPD to do not try to reprint the
# job.
#
fatal() {
    echo "$@" 1>&2
    cleanup
    exit 2
}

#
# If user removes the job, LPD will send SIGINT, so trap SIGINT
# (and a few other signals) to clean up after ourselves.
#
trap cleanup 1 2 15

#
# Make sure we are not colliding with any existing files.
#
cleanup

#
# Link the DVI input file to standard input (the file to print).
#
ln -s /dev/fd/0 hpdf$$dvi || fatal "Cannot symlink /dev/fd/0"

#
```



```
# Make LF = CR+LF
#
printf " 033&k2G" || fatal "Cannot initialize printer"

#
# Convert and print. Return value from dvi2p does not seem to be
# reliable, so we ignore it.
#
dvi2p -M1 -q -e- dfhp$.dvi

#
# Clean up and exit
#
cleanup
exit 0
```

```
5.      :
          가
          ). 가
          . 가
          .
          . file
          .
FreeBSD      apsfilter      가
          DVI
```

9.4.1.5 (output)

```
LPD      가      :
```

- LPD

- LPD 가

- LPD

가

filter-name -width -length

width pw length pl

가

() ;

가

byte

LPD

escape

가

(LPD

가).

LPD

LPD ()

LPD 2 : ASCII 001

ASCII031. 가 2 (031, 001) SIGSTOP

LPD 가 SIGCONT

가

가

LPD 가

LPD

가

가 lpf .
가 lpf
. 가 lpf .

9.4.1.6 lpf:

FreeBSD /usr/libexec/lpr/lpf (lpr -i) ,
(lpr -l), ().

lpf lpf .
lpf 가 /etc/printcap pw pl
가

9.4.2

가 가 가
.
burst 가
가 가
가 (가).
가 LPD
가
; (9.4.2.4).

9.4.2.1

```

/etc/printcap      sh      (      "
")
.
.
.

```

PCL 가 :

```

#!/bin/sh
#
# hpof - Output filter for Hewlett Packard PCL-compatible printers
# Installed in /usr/local/libexec/hpof

printf " 033&k2G" || exit 2
exec /usr/libexec/lpr/lpf

```

of .

가 teak /etc/printcap 가 ;

가 :

```

#
# /etc/printcap for host orchid
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
    :lp=/dev/lpt0:sd=/var/spool/lpd/teak:mx#0:
    :if=/usr/local/libexec/hpif:
    :vf=/usr/local/libexec/hpvf:
    :of=/usr/local/libexec/hpof:

```

가 teak . 가

lpr -h ; lpr(1)

Note: LPD (feed) 가

LPD (from feed)
(/etc/printcap sf (form feed)
)

LPD 가 /etc/printcap sh .
:

rose:kelly Job: outline Date: Sun Sep 17 11:07:51 1995

LPD .
/etc/printcap h/ (가) .

9.4.2.3

LPD :

?

가

가 lpr -h

" " 가

lpr -h

()

가 lpr -h

LPD -h

- LPD

- LPD LPRng LPD
- () 가) 가
LPD LPD 가
가 (af) 가
/etc/printcap
sh () 가

9.4.2.4

LPD LPD

가 lpr -h

) 가 3 (,

```
#!/bin/sh
#
# make-ps-header - make a PostScript header page on stdout
# Installed in /usr/local/libexec/make-ps-header
#
#
# These are PostScript units (72 to the inch).  Modify for A4 or
```

```
# whatever size paper you are using:
#
page_width=612
page_height=792
border=72

#
# Check arguments
#
if [ $# -ne 3 ]; then
    echo "Usage: `basename $0` <user> <host> <job>" 1>&2
    exit 1
fi

#
# Save these, mostly for readability in the PostScript, below.
#
user=$1
host=$2
job=$3
date=`date`

#
# Send the PostScript code to stdout.
#
exec cat <<EOF
%!PS

%
% Make sure we do not interfere with user's job that will follow
%
save

%
% Make a thick, unpleasant border around the edge of the paper.
%
```



```
$border $border moveto
$page_width $border 2 mul sub 0 rlineto
0 $page_height $border 2 mul sub rlineto
currentscreen 3 -1 roll pop 100 3 1 roll setscreen
$border 2 mul $page_width sub 0 rlineto closepath
0.8 setgray 10 setlinewidth stroke 0 setgray

%
% Display user's login name, nice and large and prominent
%
/Helvetica-Bold findfont 64 scalefont setfont
$page_width ($user) stringwidth pop sub 2 div $page_height 200 sub moveto
($user) show

%
% Now show the boring particulars
%
/Helvetica findfont 14 scalefont setfont
/y 200 def
[ (Job:) (Host:) (Date:) ] {
200 y moveto show /y y 18 sub def }
forall

/Helvetica-Bold findfont 14 scalefont setfont
/y 200 def
[ ($job) ($host) ($date) ] {
270 y moveto show /y y 18 sub def
} forall

%
% That is it
%
restore
showpage
EOF
```

DVI 가 :

```
#!/bin/sh
#
# psdf - DVI to PostScript printer filter
# Installed in /usr/local/libexec/psdf
#
# Invoked by lpd when user runs lpr -d
#

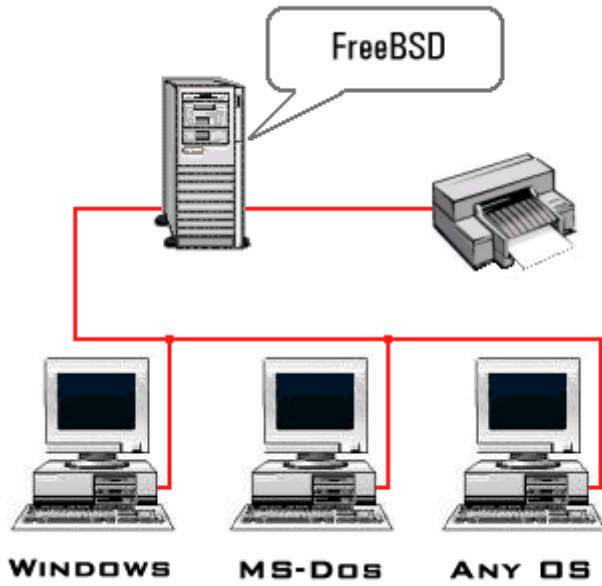
orig_args="$@"

fail() {
    echo "$@" 1>&2
    exit 2
}

while getopts "x:y:n:h:" option; do
    case $option in
        x|y) ;; # ignore
        n)   login=$OPTARG ;;
        h)   host=$OPTARG ;;
        *)   echo "LPD started `basename $0` wrong." 1>&2
            exit 2
            ;;
    esac
done

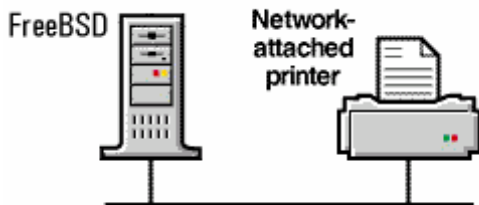
[ "$login" ] || fail "No login name"
[ "$host" ] || fail "No host name"

( /usr/local/libexec/make-ps-header $login $host "DVI File"
  /usr/local/bin/dvips -f ) | eval /usr/local/libexec/lprps $orig_args
```

•

가



◆ LPD

LPD 가

◆

가

가


```
# chmod 770 /var/spool/lpd/rattan /var/spool/lpd/bamboo
```

```
# chown daemon:daemon /var/spool/lpd/rattan /var/spool/lpd/bamboo
```

```
orchid      rattan  bamboo      .      orchid   가
            orchid  LPD         DVI     /var/spool/lpd/bamboo
```

```
% lpr -P bamboo -d sushi-review.dvi
```

```
rose 가 bamboo      LPD
rose      .      rose      rose  DVI
            (bamboo 가      ).
```

9.4.3.2 가

```
가      :
      (      )      (
)      .      가
```

```
/etc/printcap      (
),      ,      ,      ,      .      TCP/IP
```

```
.      가      ;      netprint
      netprint
가
      (      ,      )
      (FreeBSD      ).
```

```
#!/usr/bin/perl
#
# netprint - Text filter for printer attached to network
```

```
# Installed in /usr/local/libexec/netprint
#
$#ARGV eq 1 || die "Usage: $0 <printer-hostname> <port-number>";

$printer_host = $ARGV[0];
$printer_port = $ARGV[1];

require 'sys/socket.ph';

($ignore, $ignore, $protocol) = getprotobyname('tcp');
($ignore, $ignore, $ignore, $ignore, $address)
    = gethostbyname($printer_host);

$sockaddr = pack('S n a4 x8', &AF_INET, $printer_port, $address);

socket(PRINTER, &PF_INET, &SOCK_STREAM, $protocol)
    || die "Can't create TCP/IP stream socket: $!";
connect(PRINTER, $sockaddr) || die "Can't contact $printer_host: $!";
while (<STDIN>) { print PRINTER; }
exit 0;
```

```
가 가 . Diablo 750-N
scrivener . 가 :
```

```
#!/bin/sh
#
# diablo-if-net - Text filter for Diablo printer `scrivener' listening
# on port 5100. Installed in /usr/local/libexec/diablo-if-net
#
exec /usr/libexec/lpr/lpf "$@" | /usr/local/libexec/netprint scrivener 5100
```

9.4.4

.LPD 가

9.4.4.1

```

LPD 가 lpr
-#5 5
/etc/printcap sc 가 lpr(1) -#
가 -#
:

```

lpr: multiple copies are not allowed

```

(
/etc/printcap sc
가 rose /etc/printcap rattan
bamboo
sc 가
:

```

```

#
# /etc/printcap for host rose - restrict multiple copies on bamboo
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
    :sh:sd=/var/spool/lpd/rattan:
    :lp=/dev/lpt0:
    :if=/usr/local/libexec/if - simple:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
    :sh:sd=/var/spool/lpd/bamboo:sc:
    :lp=/dev/ttyd5:ms# - parenb cs8 cllocal crtscts:rw:
    :if=/usr/local/libexec/psif:

```

```
:df=/usr/local/libexec/psdf:
```

```
orchind /etc/printcap ( teak
) sc 가 :
```

```
#
# /etc/printcap for host orchid - no multiple copies for local
# printer teak or remote printer bamboo
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
    :lp=/dev/lpt0:sd=/var/spool/lpd/teak:mx#0:sc:
    :if=/usr/local/libexec/ifhp:
    :vf=/usr/local/libexec/vfhp:
    :of=/usr/local/libexec/ofhp:

rattan|line|diablo|lp|Diablo 630 Line Printer:
    :lp=:rm=rose:rp=rattan:sd=/var/spool/lpd/rattan:

bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
    :lp=:rm=rose:rp=bamboo:sd=/var/spool/lpd/bamboo:sc:
```

```
sc lpr -# 가 lpr(1)
:
```

```
% lpr forsale.sign forsale.sign forsale.sign forsale.sign forsale.sign
```

```
( )
```

9.4.4.2

```
/etc/printcap rg 가
```

```
rg
```

```
(root ) 가 : "lpr: Not a
member of the restricted group" 가
```


1000

Note: 가

LPD

rattan *bamboo* 가 가
5 MB

```
#
# /etc/printcap for host rose
#
#
# No limit on job size:
#
rattan|line|diablo|lp|Diablo 630 Line Printer:
    :sh:mx#0:sd=/var/spool/lpd/rattan:
    :lp=/dev/lpt0:
    :if=/usr/local/libexec/if-simple:

#
# Limit of five megabytes:
#
bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
    :sh:sd=/var/spool/lpd/bamboo:sc:rg=artists:mx#5000:
    :lp=/dev/ttyd5:ms#-parenb cs8 clocal crtscts:rw:
    :if=/usr/local/libexec/psif:
    :df=/usr/local/libexec/psdf:
```

/etc/printcap *mx*

9.4.4.4

LPD

가 :

```

가 LPD /etc/hosts.equiv
/etc/hosts.lpd . LPD
LPD
:
/etc/hosts.equiv ruserok(3) rsh(1) rcp(1)
rose /etc/hosts.lpd :
```

```

orchid
violet
madrigal.fishbaum.de
```

```

rose 가 orchid violet madrigal.fishbaum.de
가 rose LPD
```

```

가
minfree
```

가 가

: minfree

bamboo minfree 가 .
/etc/printcap ; *bamboo* 가 :

```
bamboo|ps|PS|S|panasonic|Panasonic KX-P4455 PostScript v51.4:
:sh:sd=/var/spool/lpd/bamboo:sc:rg=artists:mx#5000:
:lp=/dev/ttyd5:ms# - parenb cs8 clocal crtscts:rw:mx#5000:
:if=/usr/local/libexec/psif:
:df=/usr/local/libexec/psdf:
```

sd . LPD 가
3 MB (6144) :

echo 6144 > /var/spool/lpd/bamboo/minfree

/etc/printcap *rs* 가
. *rs* 가 가
LPD . LPD

가 /usr/bin/false

“token”

9.4.5

가

LPD

()

()

가 :

-

가

-

가

가

가

"

가

LPD

가

:

()

가

9.4.5.1

FreeBSD

가

“lpf:

pac(8)

LPD

./etc/printcap af

가

LPD

(pw pl) lpf . lpf

```
2.00 rose:andy
3.00 rose:kelly
3.00 orchid:mary
5.00 orchid:mary
2.00 orchid:zhang
```

lpf

lpf

/etc/printcap af=acct

acct

가 pac(8)

pac

Login	pages/feet	runs	price
orchid:kelly	5.00	1	\$ 0.10
orchid:mary	31.00	3	\$ 0.62
orchid:zhang	9.00	1	\$ 0.18
rose:andy	2.00	1	\$ 0.04
rose:kelly	177.00	104	\$ 3.54
rose:mary	87.00	32	\$ 1.74
rose:root	26.00	12	\$ 0.52
total	337.00	154	\$ 6.74

pac(8)

:

- *Pprinter*

printer . /etc/printcap *af* 가

- *c*

- *m*

gamma smith . alpha smith
가 .

- *pprice*

/etc/printcap *pc* *price*
2 () . *price* .

- *r*

- *s*

name...

names

pac(8)가

가 (가
pac -m :

Login	pages/feet	runs	price
andy	2.00	1	\$ 0.04
kelly	182.00	105	\$ 3.64
mary	118.00	35	\$ 2.36
root	26.00	12	\$ 0.52
zhang	9.00	1	\$ 0.18
total	337.00	154	\$ 6.74

```

pac(8) /etc/printcap ( 200 2 )
pc 가
-p pac(8) -p
가 가 1 50

```

pac -pl.50

```

pac -s
_sum 가
pac(8)
가

```

9.4.5.2

가?

가 :

lpf (lpf:)

lpf

가?

DVI

DVI

dvilj dvips

가

가?

가

가

가

가

가

가

9.5

FreeBSD

:

lpr(1)

lpq(1)

lprm(1)

LPD

lpc(8)

lpr(1), lprm(1) lpq(1) 3 가 /etc/printcap
/ -P printer-name
-P PRINTER
lp PRINTER
lp PRINTER PRINTER 가

9.5.1

% lpr filename ...

lpr(1)

가

% lpr /etc/host.conf /etc/hosts.equiv

:

% lpr -P printer-name filename ...

rattan

:

% ls -l | lpr -P rattan

lpr(1)

lpr ls -l

lpr(1)

9.5.2

lpr(1)

LPD

가

lpq(1)

-P

bamboo

% lpq -P bamboo

lpq

:

bamboo is ready and printing

Rank	Owner	Job	Files	Total Size
active	kelly	9	/etc/host.conf, /etc/hosts.equiv	88 bytes
2nd	kelly	10	(standard input)	1635 bytes
3rd	mary	11	...	78519 bytes

```

bamboo          3          .          kelly 가
9 가          .          가
가
.

9          ;          lpr(1)
.          ( active "Rank" )
가          .          lpr(1)
.          mary 가 ;
가          lpq(1)          3          (.)

lpq(1)          :          가          (
가          LPD 가          )

lpq(1)          -/          .          lpq -l
가 :

```

```

waiting for bamboo to become ready (offline ?)
kelly: 1st          [job 009rose]
    /etc/host.conf          73 bytes
    /etc/hosts.equiv          15 bytes

kelly: 2nd          [job 010rose]
    (standard input)          1635 bytes

mary: 3rd          [job 011rose]
    /home/orchid/mary/research/venus/alpha-regio/mapping 78519 bytes

```

9.5.3.

```

lprm(1)
lprm(1)

```

lpq(1)

:

% lprm job - number

-P 가 . *bamboo*

10 :

% lprm -P bamboo 10

lprm(1) 가 가 :

lprm -

() .

lprm *user*

*user*가 () .
;

lprm

- lprm(1)

-P .
rattan :

% lprm -P rattan -

Note: lprm(1)

```
% lpr -P rattan myfile
% rlogin orchid
% lpq -P rattan
Rank  Owner      Job  Files      Total Size
active seeyan   12   ...      49123 bytes
2nd   kelly      13  myfile      12 bytes
% lprm -P rattan 13
rose: Permission denied
% logout
% lprm -P rattan 13
dfA013rose dequeued
cfA013rose dequeued
```

9.5.4

lpr(1) , , .

9.5.4.1

lpr(1) 가
pr(1) .
bamboo : DVI (TeX typesetting) fish-report.dvi
% lpr -P bamboo -d fish-report.dvi

DVI ditroff

Note: *-p -T*

가 . *-d* DVI 가 .

-c

cifplot .

-d

DVI .

-f

FORTTRAN .

-g

plot .

-i number

number

; number

8

Note: *-i*

-l

-n

ditroff(troff)

-P

pr(1)

pr(1)

-T *title*

pr(1)

title

-p

가

-t

troff

-v

raster

가 :

ls(1)

:

% zcat /usr/share/man/man1/ls.1.gz | troff -t -man | lpr -t

```
zcat(1)      ls(1)
              lpr (      LPD      )
troff(1)     .      -t      lpr(1)      GNU troff
              가      .
```

9.5.4.2

```
lpr(1)      LPD 가      :
```

- # copies

가

```
parser.c   parser.h      3      :
```

```
% lpr -#3 parser.c parser.h
```

-m

LPD 가

가

-s

```
가      )
.LPD 가
```

: LPD 가

Note:

LPD

-s

-r

-s

!

9.5.4.3

lpr(1)

가

-C *text*

text

-J *text*

text

stdin

-h

Note:

9.5.5

lpc(8) :
 • /
 • /
 •
 : 가
 가 가
 (root)
 가
 lpc(8) root
 lpc(8)
 lpc(8) *printer-*
name . *printer-name* *all* /etc/printcap
 abort *printer-name*
 가

clean *printer-name*

. 가

LPD

disable *printer-name*

. 가

(root)

: root

. 가

enable

down *printer-name message*

. disable

stop

. *message*

lpq(1) lpc status

enable *printer-name*

. 가

help *command-name*

command-name

. *command-name*

restart *printer-name*

```

    . LPD 가
    stop down
restart abort start .
```

start *printer-name*

stop *printer-name*

topq *printer-name job-or-username*

```

    printer-name job username
    printer-name all .
```

up *printer-name*

```

; down . start enable .
```

```
lpc(8) . lpc(8)
exit, quit .
```

9.6

FreeBSD LPD
:"
가(FreeBSD 가)?"
LPRng
"LPR: " LPRng PLP
Patrick Piwell Justin Mason (PLP) LPRng
LPRng http://www.lprng.org

CUPS

Common UNIX Printing System **CUPS** 가

Easy Software Products 가

CUPS Internet Printing Protocol
(IPP) . Line Printer Daemon(LPD) Server Message Block (SMB)
AppSocket (a.k.a JetDirect) . CUPS

PostScript Printer Description (PPD) 가 .

CUPS http://www.cups.org/

9.7

lptest(1)

가 PRINT
REMAINING FORM FEED

가
FORM FEED (

/usr/local/libexec/if - simple

```
#!/bin/sh
#
# if - simple - Simple text input filter for lpd
# Installed in /usr/local/libexec/if - simple
#
# Simply copies stdin to stdout. Ignores all filter arguments.
# Writes a form feed character ( f) after printing job.

/bin/cat && printf " f" && exit 0
exit 2
```

```
!"#$%&'()*+,-./01234
"$%&'()*+,-./012345
#$%&'()*+,-./0123456
```

가
가
: ASCII 10, (LF). MS-DOS, OS/2
가 ASCII 10 ASCII 13 (carriage return
CR). MS-DOS

FreeBSD

가

FreeBSD 가

:

Printer received CR

Printer prints CR

Printer received LF

Printer prints CR + LF

가

:

•

Note: FreeBSD

가

CR LF

•

CR+LF

FreeBSD

가

LF

/etc/printcap

ms#

onlcr

•

escape code

가 LF

가

escape

escape

PCL escape

가

가 LF

LF CR

;

;

```
#!/bin/sh
```

```
#
```

```
# hpif - Simple text input filter for lpd for HP-PCL based printers
# Installed in /usr/local/libexec/hpif
#
# Simply copies stdin to stdout. Ignores all filter arguments.
# Tells printer to treat LF as CR+LF. Ejects the page when done.

printf " 033&k2G" && cat && printf " 033&l0H" && exit 0
exit 2
```

```
orchid /etc/printcap 가 . teak
3Si 가
```

```
#
# /etc/printcap for host orchid
#
teak|hp|laserjet|Hewlett Packard LaserJet 3Si:
    :lp=/dev/lpt0:sh:sd=/var/spool/lpd/teak:mx#0:
    :if=/usr/local/libexec/hpif:
```

가 가

. FreeBSD 가

LF 가 CR

LF CR

Printer receives Printer prints

CR

CR

LF CR + LF

가

가

가

(

가

).

가

:

- 가 XON/XOFF *ms# ixon*
FreeBSD
- 가 (carrier) *ms# crtscts*

가

. *br*

bps *ms#*

; 가

/etc/printcap

가 FreeBSD

/etc/printcap

(*lf*)

가

rattan

lf

가

:

rattan|line|diablo|lp|Diablo 630 Line Printer:

```
:sh:sd=/var/spool/lpd/rattan:  
:lp=/dev/lpt0:  
:if=/usr/local/libexec/if - simple:  
:lf=/var/log/rattan.log
```

```
      .                               (  
/var/log/rattan.log) .
```

```
lf                               LPD                               /dev/console .
```